

## 4-5 Structure Calculations

Structure design calculations and independent design check calculations must be submitted as part of PS&E submittals.

Design calculations shall include all analysis and computations that were necessary in designing the bridge including the bridge layout, structural elements, and operational features such as deck drains.

Check calculations shall include all analysis and computations that are necessary to independently check all aspects of the design shown on the unchecked details. Results from the check calculations shall be compared with the design. Discrepancies shall be resolved between the designer and checker and the resolutions documented in the calculations.

For Initial PS&E submittals, full sets of design and check calculations are required. For Intermediate and Final PS&E submittals, only supplemental design and check calculations need to be submitted for re-designs and any other changes made to the structure since the initial submittal.

The consultant must retain the design and check calculations at least until the project is built and is cleared of all claims and lawsuits in accordance to the *Memos to Designers*. OSFP will not retain submitted copies of the calculations once the PS&E is approved.

Design and check calculations shall conform to the following additional requirements:

- Must be bound separately from each other for each bridge.
- Must be labeled with whether they are design or check calculations they are and with the District, EA, Bridge Name, and Bridge Number.
- Must bear the State of California Registered Professional Engineer Registration seal with the signature, license number, and registration certificate expiration date of the design engineer and independent check engineer.
- Must contain a table of contents that refers to page numbers--all pages must be numbered.
- Must be legible and organized so that the design logic can be easily followed.
- Must contain only final computer runs including input and output sheets.
- Must contain sufficient notes on calculation sheets, computer input/output, and on other documentation to clearly show the design logic.
- Must contain copies of design charts with the specific entries highlighted that were used in the design.
- Must document all assumptions and conclusions.



### Deliverables

<u>Items</u>	<u>Number of Copies for Each PS&amp;E Stage <sup>1</sup></u>		
	<u>Initial</u>	<u>Intermediate</u>	<u>Final <sup>2</sup></u>
Design Calculations	1	1	--
Check Calculations	1	1	--

<sup>1</sup> Submit the documents and number of copies shown unless otherwise the Liaison Engineer approves or requests otherwise.

<sup>2</sup> Number of copies shown assumes that all documents were reviewed and determined to be final in previous PS&E reviews.